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Magic-Eye Translator

By FRANK HENRY

THE urgent need of the United States to discover quickly, through the barrier of languages, the aims and scientific achievements of its potential enemies—and its present friends—has gone far beyond the productive powers of human translators.

The result is a massive, multimillion-dollar effort by the Army, Navy, Air Force and the Central Intelligence Agency to perfect lightning-swift translations by electronic computers — intelligent robots with the speed for translating 50,000 words an hour — in contrast to the average 2,600 words a day translating by human linguists.

The United States Bureau of Standards and about 20 universities and industrial firms are conducting research, financed by Government grants. Some of the researchers are paying from $375 to $720 an hour for experimental translations on the big computers. The Air Force alone is paying nearly $3,000,000 a year to its group of researchers.

In the do-or-die race for the technologies, in the competition for the knowledge that creates them, the United States and Russia are, of course, the chief antagonists — and Communist China is moving along as a contender to be reckoned with.

Soviets More Intense

For five years Russia has engaged in research on fast computer translations and its effort, according to reports, is vastly bigger and more intense than that of the United States.

Russia has a considerable head start on the United States — despite the fact that the art of computer translation originated here, in New York, in January, 1954. The originator is Dr. Leon E. Dostert, long a language expert at Georgetown University, Washington. He is founder and director of the University's Institute of Languages and Linguistics and he heads the CIA's computer translation project at the university.

mentous translations conservative scholars looked upon them as "feats of gadgetry" and even "charlatanism."

It was not until the Russians published a serious analysis of the American achievement, and started their own projects, that the computer translation effort in this country began to accelerate.

Progress Rapid

Dr. Dostert says computer translation is still in the experimental stage, but rapid progress is being made. He predicts that in six months to a year they will be practical and clicking out millions of words to the human translators' tens of thousands.

And the next step — still somewhat in the future, he says—will be the invention of a special translating robot to take the place of the general purpose computers now being used. When this is achieved, Dr. Dostert adds, his first translations of 1954 will be as "the Kitty Hawk of the mechanical translating art."

The need for swift, mass translations of engineering and scientific articles and books — especially from the Russian — is heavily underscored by statements made at a hearing on robot translations recently held by the Committee on Science and Astronautics of the House of Representatives.

In Russia alone more than 780,000,000 words of scientific and technological literature are being published each year. It is expected that by 1970 this volume will increase astronomically. Authorities say the Soviet bloc of nations will be turning out 12,000,000,000 words of science and technology.

Niagara Of Words

From the Russian output alone, the testimony adds, the United States will undertake to translate 2,500,000,000 words. Here is a concrete picture of the big task, taken from the record of the hearing:

"Even if a moderate criterion — the need to translate only critical intelligence

the Russians had already solved scientific problems Americans were still working on. The solutions were thus handed to them and they were able to go on to something else — or to begin refinements 'on the Russian conclusions — a great saving of money, work and time.

Time is an obvious, factor in the translation of intelligence documents. By quick translations the CIA and other Government agencies can prepare for eventualities or take countermeasures.

In the face of the colossal job confronting them, just how effective have the computers been? And how effective will they become a year from now?

The Human Hand

At present, and certainly in the immediate future, the robot translations must be edited by humans so that they can be read smoothly and idiomatically and, sometimes, clarified. The translations are made from codes. Each code mark indicates a letter of the language in which the translation is to be made. From these words are formed: the result is literalness, sometimes ungrammatical. Here are a few words from unedited Russian translations:
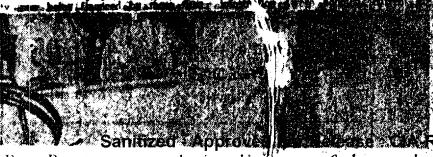
"A reaction were conducted in a three-necked flask, which was equipped by a mechanical stirrer." The next sentence began more grammatically: "At first experiments were conducted . . ." And an example of literalness: "By us was established, that already . . ."

These translations, passages from science articles, were made by Dr. Dostert's project at Georgetown. Despite the need for editing, Dr. Dostert says, the lightning-like computer translations are the only solution for the monumental job ahead.

Grammar A Problem

Dr. Dostert and other scholars in this vast research are engaged in the complex and puzzling effort to transfer logical relationship of words (grammar) mechanically from one language to another [...]

Countering Ivan

The Georgetown project has made preliminary steps toward translations from English into Chinese and from English into Arabic. And Dr. Dostert agreed that many other languages must in the future be added to the computers' repertoire.

"Language," he said, "is the only way we can present our case and our achievements necessary in our relations with the many new nations established lately.

Doctor Dostert uses tape recorders in teaching languages. Students record